ToughSonic™ Distance Sensors
Waterproof, Dual Outputs and Push-Button "Teachable"
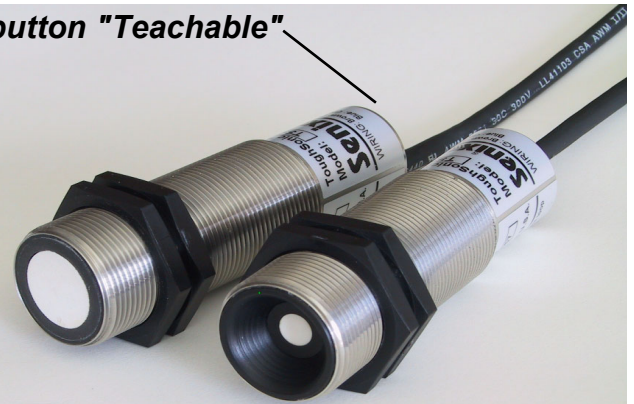
TS-30S Series

TS-30S ultrasonic distance sensors contain a rugged transducer in a stainless steel case for long service life in tough environments. Typical applications include roll diameter, liquid level, motion control, positioning and dimensioning. They are excellent in tanks, drums and level applications.

Two outputs are available in many combinations, including analog 0-10/0-5 VDC, 4-20 ma. current loop, PNP (sourcing) switches, NPN (sinking) switches and RS-232/485 serial data. All outputs are relative to measured distance and adjustable anywhere in the sensor's range.

Non-Contact Ultrasonic Air Distance Measurement

Push-button "Teachable"

Up to 14-ft (4.25m) range in IP68 rated 30mm threaded housing

Features

- Sealed for ingress protection rating IP68 for washdown or outdoor applications like food processing or car washes
- Narrow ultrasonic beam to avoid unwanted obstacles
- Simple pushbutton "teachable" setup of many features, and calibration using actual targets
- Analog outputs are distance-proportional and adjustable anywhere in sensor's range
- Several standard analog output ranges
- Switch outputs have adjustable distance and polarity
- Output response filter for stability with poor targets
- Sync connection for several sensors in close proximity
- Security "Lock" prevents accidental mis-adjustment
- All in one small package!

Reliable Operation

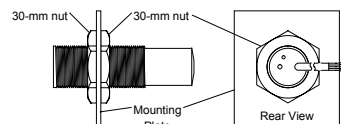- Detects solid or liquids
- Unaffected by optical factors like color, transparency, reflectivity or opaqueness
- Stable output if target is lost
- Industrially rated interfaces
- Heavy duty 303 stainless case, 30x1.5 mm threaded, waterproof with IP68 rating

Easy Installation

- Quick bolt-in mounting
- Permanently attached cable
- Rear indicator displays output status and fault conditions
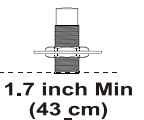- Simple push-button setup - no potentiometers!

Two Ranges

The TS-30S series is available in two ranges. The shorter range model is useful when a small deadband is required due to space limitations.
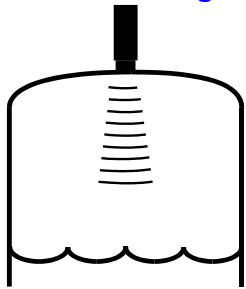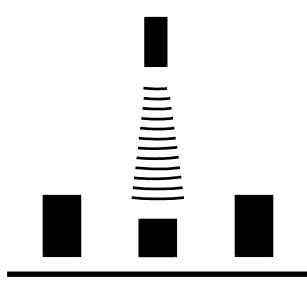

TS-30S1 Series | **TS-30S3 Series**

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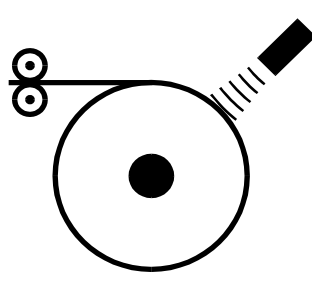
4 inch Min (102 mm) | 1.7 inch Min (43 cm)

14 inch Max (356 mm)
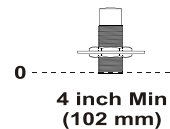
14 Ft Max (4.25 m)

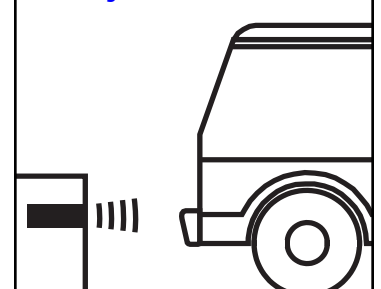---

Level or Height

Dimension/Sort

Roll Diameter

Object Detection

TS-30S Dual Output Teachable Distance Sensors

Target Performance of TS-30S1 Long Distance Model

Target Area Coverage for Typical Targets

Inches Off Axis: 36.0, 18.0, 0.0, -18.0, -36.0

2-5/8" Diameter Cylinder

Flat Surface, measured by rotating sensor

Inches: 20, 40, 60, 80, 100, 120, 140, 160, 180, 200

3-1/2" Floppy Disk measured by rotating sensor

Angle off perpendicular (+/-) vs. distance (ft.), large flat surface													
Ft:	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Deg:	17	13	13	12	12	11	10	10	9	8	6	5	5	4
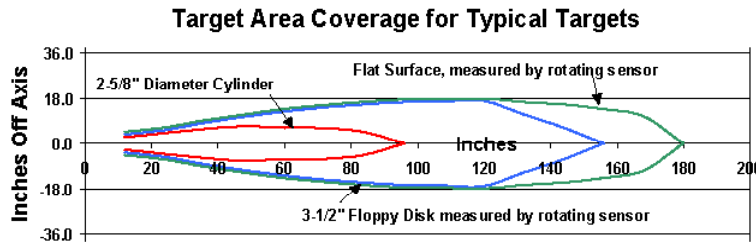
Color/Transparency
Unaffected by color, transparency or optical characteristics.

Orientation
Detects flat or curved objects. Surface must reflect back to sensor. Flat surfaces are best when perpendicular to beam axis, and may not be detected at high angles of incidence.
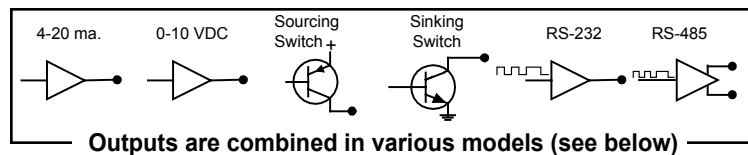
Typical Distances

Object	Max Range (ft.)
2-5/8-in. diam. cylinder	7
3.5-in. floppy disk	10
Liquid surface	14

Specifications

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Range	Three ranges (see page 1)	**Adjustments**	Push-button, permanently stored
Case Material	303 stainless steel	**Transducer**	Ruggedized piezoelectric
Temperature	-40 to 70 degrees C -40 to 158 degrees F	**Input Power**	10-30 VDC @ 35 ma. nominal 15-30 VDC if using analog output
Protection	NEMA-4X, NEMA-6P, IP68	**Humidity**	0 to 100% operating
Resolution	0.003384 in. (.086 mm) max.; Analog 12 bits over spanned distance		
Repeatability	Nominal 0.1% of range @ constant temp. Affected by target, distance, environment		
Update Rate	20 measurements per second, output response time filter push-button adjustable		
Voltage Output	0-10 and 0-5 VDC (user selectable), 10 ma. max., push-button teachable endpoints		
Current Loop	4-20 ma. current sourcing, max. loop resistance 1k @ 24 VDC, teachable endpoints		
Switch Outputs	150 ma. max, sinking 40 VDC max., teachable switching points and polarity		
RS-232, RS-485	6 bytes, 9600 baud, 8 data bits, 1 stop bit, no parity, transmitted 20 times per second		
SYNC feature	Permits up to 32 sensors to be wired together for operation in the same area		

Models & Outputs

4-20 ma.   0-10 VDC   Sourcing Switch +   Sinking Switch   RS-232   RS-485

Outputs are combined in various models (see below)

Wiring (5-wire cable)

Brown	DC+ IN
Blue	GND
Gray	SYNC
Black	see below
White	see below

MODEL NUMBER	Output #1 (BLACK wire)	Output #2 (WHITE wire)
TS-30S*-IV	4-20 ma. current loop	0-10 / 0-5 VDC
TS-30S*-ISK	4-20 ma current loop	Sinking Switch
TS-30S*-ISR	4-20 ma. current loop	Sourcing Switch
TS-30S*-SKV	Sinking Switch	0-10 / 0-5 VDC
TS-30S*-SRV	Sourcing Switch	0-10 / 0-5 VDC
TS-30S*-SKSK	Sinking Switch	Sinking Switch
TS-30S*-SRSR	Sourcing Switch	Sourcing Switch
TS-30S*-SKSR	Sinking Switch	Sourcing Switch
TS-30S*-SK232	Sinking Switch	RS-232 Output
TS-30S*-SR232	Sourcing Switch	RS-232 Output
TS-30S*-485	RS-485+ Output	RS-485- Output

* Replace asterisk (*) with 1 or 3 depending on the desired range

Dimensions

Inches (mm)

4.062 (1032)

1.30 (330)

1.05 (267)

0.05 (12.7)

M30x1.5 THREAD
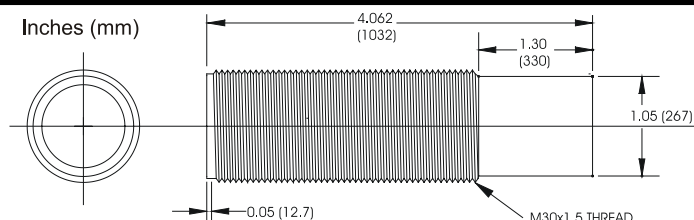
Dimensions are in inches (mm)

Mounting Hole: 1.2 in. (30.5 mm) diameter

Standard Cable: 6-ft (2 m)

Ships with instructions and two 30mm plastic mounting nuts

3/17/03